

REMARKS

Claims 1-23 are pending in the application. Claims 16-23 have been withdrawn from consideration. Claim 1 was objected to because of grammatically awkward language. Claims 6 and 7 were objected to under 35 U.S.C. 112, second paragraph, as being indefinite. Claims 1-3, 6-9, 14 and 15 were rejected under 35 U.S.C. 102(e) as being anticipated by Iwasaki et al. (U.S. Patent No. 6,169,935). Claims 4-5 were rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki in view of Ono et al. (U.S. Patent No. 5,527,390). Claims 10-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki in view of Kondo et al. (U.S. Patent No. 6,097,492). Claims 1 and 2 have been canceled. Claims 3, 6-8, 10, 14 and 15 have been amended. New claims 24 and 25 have been added. Entry of the amendments, reexamination, and reconsideration of the application in view of the following remarks is requested.

Claim 1 was objected to because of grammatically awkward language. Because claim 1 has been canceled, the objection is now moot.

Claims 6 and 7 were objected to under 35 U.S.C. 112, second paragraph, as being indefinite due to unclear language. Claims 6 and 7 have been amended to replace the phrase “wherein a second stage amongst the stages [is] provided at the second section,” and clarify the term “external.” As amended, it is respectfully submitted that the objection to claims 6 and 7 has been overcome.

Claims 1-3, 6-9, 14 and 15 were rejected under 35 U.S.C. 102(e) as being anticipated by Iwasaki. Claims 1 and 2 have been canceled, and because claims 3, 6-9, 14 and 15 depended from claim 1, these rejections are now moot. New claim 24 has been added, and claims 3, 6-9, 14 and 15 have been amended to depend from claim 24. New claim 24 is clearly distinguishable from Iwasaki.

The present invention is directed to a substrate processing apparatus having a plurality of stages. Each stage is capable of supporting containers for transporting substrates. The stages may be used to remove or place substrates in a container. Each stage has a cut-away area

extending from one end of the stage. A movable table for carrying containers between stages is able to move vertically through the cut-away area of a stage, lift a container located at the stage and withdraw it from the stage through the cut-away area, in order to transport the container to another stage.

Iwasaki fails to teach a cut-away area in each stage through which a movable table can move vertically to lift a container and withdraw the container from the stage. The Examiner equates a stage as described in the present application with either a processing apparatus 32 or a stocker shelf 96 in Iwasaki. However, the processing apparatus, which is a large, complex apparatus that performs wafer processing functions, is not equivalent to a stage as described in the present invention, which is an area onto which a container may be placed. Furthermore, unlike the present invention as defined in claim 24, neither the processing apparatus nor the stocker shelf contains a cut-away opening through which a movable table can move vertically. The Examiner equates a cut-away area as described in the present invention with a port 100 in Iwasaki. However, the port, which is simply an area to place a cassette, is not equivalent to a opening in a stage through which a movable table can move vertically. The port in Iwasaki is not an opening in a horizontal surface, so no movable table can move vertically through the port to lift and withdraw the cassette. In addition, although the Examiner equates a movable table as described in the present application with a conventional automatic carrier 38, an inlet delivery port 104, or port 98 in Iwasaki, none of these structures moves vertically through port 100 (i.e., the cut-away area as characterized by the Examiner).

Because Iwasaki does not contain all of limitations of claim 24 of the present invention, claim 24 is not anticipated by Iwasaki. Furthermore, because claims 3, 6-9, 14 and 15 depend from claim 24, these claims are also not anticipated by Iwasaki.

Claims 4-5 were rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki in view of Ono. This rejection is respectfully traversed.

The Examiner acknowledged that Iwasaki does not teach a turning mechanism for turning a guide rail horizontally between a first position below the stage and a second position away from the stage, as in the present invention defined in claim 4. The Examiner also noted that Iwasaki does not teach a second horizontal moving mechanism for moving the movable table, a horizontal moving mechanism, and a lifting mechanism to positions adjacent to the stages, as in the present invention defined in claim 5. However, the Examiner asserted that Ono teaches a turning mechanism for turning a guide rail horizontally between a first position below the stage and a second position away from the stage, and that Ono teaches a second horizontal moving mechanism for moving the movable table, a horizontal moving mechanism, and a lifting mechanism to positions adjacent to the stages.

Ono fails to teach a cut-away area in each stage through which a movable table can move vertically to lift a container and withdraw the container from the stage, as in the present invention defined in claim 4. Nowhere in Ono is a cut-away area in a stage described. Moreover, Ono does not teach turning a guide rail between a position below the stage to a second position. Ono discloses a treatment apparatus, and discloses a horizontal moving mechanism (carrier liner 22) and a turning mechanism (carrier transfer unit 26) independent of the horizontal moving mechanism. The turning mechanism orients the carriers at an I/O station, but the guide rail that guides the horizontal moving mechanism is fixed, and does not move with the turning mechanism. Although the Examiner stated that the cylinder 72 of the carrier liner rotates, nowhere in Ono is the rotation of the cylinder described. Indeed, as FIG. 1 of Ono illustrates, the carrier liner only performs orthogonal accesses to the various treatment stations, and therefore has no need for horizontal rotation. The cylinder is only used to adjust the height of the carrier liner. Horizontal rotation of the carrier liner would only lead to misalignment of the carriers and the carrier liner, and thus Ono actually teaches away from such a rotation.

Because neither Iwasaki nor Ono teaches or suggests a cut-away area in each stage through which a movable table can move vertically to lift a container and withdraw the container

from the stage, and because neither Iwasaki nor Ono teaches or suggests turning a guide rail between a position below the stage to a second position, as in claim 4, the rejection of claim 4 under 35 U.S.C. 103(a) is traversed. Because claim 5 depends from claim 4, the rejection of claim 5 is also traversed for the same reason.

Claims 10-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki in view of Kondo et al. (U.S. Patent No. 6,097,492). This rejection is respectfully traversed.

The Examiner acknowledges that Iwasaki does not teach a sensing device for inspecting the condition, number, and orientation of substrates in the container, as in the present invention defined in claim 10, but maintains that Kondo teaches these limitations.

However, Kondo does not teach a sensing device provided at a movable table for inspecting the condition of substrates in a container. Kondo discloses a wafer detection apparatus which includes a photoelectric sensor 11 attached to a sensor slide block 12a. The sensor slide block is separate from a holding means (not shown in Kondo) for supporting a wafer carrier 30. A drive mechanism 12 moves the sensor slide block and photoelectric sensor across the wafer carrier, which is held in a fixed position by the holding means. Thus, Kondo discloses supporting the carrier with a fixed table instead of a movable table, and discloses a sensing device attached to a sensor slide block instead of a movable table.

Furthermore, Kondo actually teaches away from providing a sensing device at a movable table for supporting the carrier. Kondo is directed to the detection of the condition of wafers in a carrier, and thus Kondo contains no disclosure at all related to a movable table for transporting carriers between stages. Kondo only discloses carriers fixed in place by a holding means. The sensing device cannot be attached to the holding means, otherwise there could be no movement of the sensing device with respect to the wafers. Thus, the sensing device in Kondo is attached to a sensor slide block separate from the holding means, and requires a separate drive mechanism dedicated to moving the sensing device across the wafers.

In contrast, the present invention takes advantage of a movable table used for transporting carriers between stages, and takes advantage of the fact that the movable table passes under and across the wafers as the movable table is moved into position under the carrier. By attaching the sensing device to the movable table, wafer detection can be efficiently performed as the movable table is moved into position prior to transporting the carrier, utilizing the same drive mechanism.

Because neither Iwasaki nor Kondo teaches or suggests a sensing device provided at a movable table for inspecting the condition of substrates in a container, as in claim 10, the rejection of claim 10 under 35 U.S.C. 103(a) is traversed. Because claims 11-13 depend from claim 10, the rejection of claims 11-13 is also traversed for the same reasons.

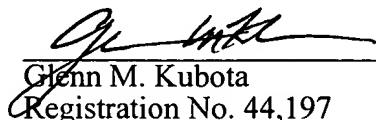
Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with markings to show changes made".

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 199372001800.

Respectfully submitted,

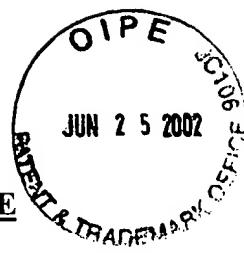
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 1 and 2 have been canceled without prejudice.

Claims 3, 6-8, 10, 14, and 15 have been amended as follows:

3. (Amended) The substrate processing apparatus according to claim [2]24, further comprising:

a horizontal moving mechanism horizontally moving the movable table between a first position adjacent to the portion of the stage on which the container is to be placed and a second position apart from the stage; and

a lifting mechanism vertically moving the movable table.

6. (Amended) The substrate processing apparatus according to claim [1]25, [further comprising a second section at which]wherein the container is received from [an external of]outside the apparatus and/or is [delivered to the external of]made available for delivery to a source outside the apparatus[therefrom, wherein a second stage amongst the stages provided at the second section].

7. (Amended) The substrate processing apparatus according to claim [1]25, wherein the container is received from outside the apparatus and/or is made available for delivery to a source outside the apparatus, the apparatus further comprising:

a moving mechanism for moving the movable table;[and
a second section at which the container is received from an external of the apparatus and/or is delivered to the external of the apparatus therefrom, wherein a second stage amongst the stages is provided at the second section,]

wherein the moving mechanism is disposed on a level lower than that of the first and second stages.

8. (Amended) The substrate processing apparatus according to claim [1]25, wherein said apparatus is an integrated unit, and wherein the second section is a section where the container is received from an external of the apparatus and/or is delivered to the external of the apparatus therefrom, said apparatus further comprising:

[a second section at which the container is received from an external of the apparatus and/or is delivered to the external of the apparatus therefrom, wherein a second stage amongst the stages is provided at the second section;]

a first shutter isolating the second section from an external of the apparatus to inhibit access to the second section from the external of the apparatus; and
a second shutter disposed on a side opposite, with respect to the second section, to a side on which the first shutter is disposed.

10. (Amended) The substrate processing apparatus according to claim [2]24, further comprising a sensing device provided at the movable table and inspecting a condition of the substrates contained in the container.

14. (Amended) The substrate processing apparatus according to claim [1]25, wherein said apparatus is an integrated unit, and wherein the second section is a section where the container is received from an external of the apparatus, [further comprising:

a second section at which the container is received from an external of the apparatus, wherein a second stage amongst the stages is provided at the second section; and

a third section at which the container is delivered to the external of the apparatus therefrom, wherein a third stage amongst the stages is provided at the third section,]

said apparatus further comprising a third stage, on which a container for containing substrates therein is to be placed, provided in a third section of said apparatus, wherein the third section is a section where the container is delivered to the external of the apparatus therefrom,

wherein the third stages has a cut-away area extending from one end of the stage, the cut-away area permits the movable table moving vertically through the cut-away area in order to lift the container from the third stage and withdraw the movable table thus lifted from above the third stage, and

wherein the moving table transports the container between the first, second and third stages.

15. (Amended) The substrate processing apparatus according to claim [1]24, further comprising a passage means through which the moving table moves and transports the container between [the first stage and the another stage]the first and second stages.